

WHAT IS CLAIMED IS:

1. An illumination optical system for illuminating a mask using light from a light source,
5 said illumination optical system comprising a shape varying mechanism for continuously making a shape of an effective light source variable,
wherein said shape varying mechanism includes:
 - 10 a first stop plate that has a first aperture part for allowing the light to pass through the first aperture part; and
 - 15 a second stop plate that has second aperture part for allowing the light that has passed through the first stop plate through the second aperture part.
2. An illumination optical system according to claim 1, wherein said effective light source has two independent areas that decenter from an optical axis of
20 the light.
3. An illumination optical system according to claim 1, wherein said effective light source has four independent areas that decenter from an optical axis of
25 the light.

4. An illumination optical system according to
claim 1, wherein the first aperture part is almost
equal in shape to the second aperture part.

5 5. An illumination optical system according to
claim 1, wherein the first and second aperture parts
have one of shapes of a sector, a circle, an ellipse,
and a polygon.

10 6. An illumination optical system according to
claim 1, further comprising a shape adjusting mechanism
for adjusting a shape of the effective light source.

15 7. An illumination optical system according to
claim 6, further comprising a detector for detecting a
shape of the effective light source at an exit side of
said shape adjusting mechanism.

20 8. An illumination optical system according to
claim 6, wherein the shape adjusting mechanism includes
optics to change a relative ratio of an area of the
effective light source.

25 9. An illumination optical system according to
claim 8, wherein the optics has a cone or polygonal
shape.

10. An illumination optical system according to
claim 1, wherein the shape varying mechanism includes
at least one cylindrical lens, inserted into and
ejected from an optical path of the light at a side of
5 the light source, for adjusting an aspect ratio of the
effective light source.

11. An illumination optical system according to
claim 10, wherein a direction of a generating line of
10 the cylindrical lens is rotatably adjusted on a surface
orthogonal to optical axis of the light of the
effective light source.

12. An illumination optical system according to
15 claim 1, wherein said effective light source has a
sectional area that decenters from an optical axis of
the light.

13. An illumination optical system according to
20 claim 12, wherein said shape varying mechanism varies a
shape of the sectoral area in a radial direction
continuously.

14. An exposure method comprising the step of
25 illuminating a mask that arranges a contact-hole
pattern and an auxiliary pattern smaller than the
contact-hole pattern, using an illumination optical

system for illuminating the mask using light from a light source so as to resolve the contact-hole pattern and restrain the auxiliary pattern from resolving,

wherein said illumination optical system

5 includes a shape varying mechanism for continuously making a shape of an effective light source variable,

wherein said shape varying mechanism

includes:

a first stop plate that has a first aperture
10 part for allowing the light to pass through the first aperture part; and

a second stop plate that has second aperture part for allowing the light that has passed through the first stop plate through the second aperture part.

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15. An exposure apparatus comprising:

an illumination optical system for illuminating a mask using light from a light source; and

20 a projection optical system for projecting light from said illumination optical system onto an object to be exposed,

wherein said illumination optical system includes a shape varying mechanism for continuously making a shape of an effective light source variable,
25 wherein said shape varying mechanism includes:

a first stop plate that has a first aperture part for allowing the light to pass through the first aperture part; and

5 a second stop plate that has second aperture part for allowing the light that has passed through the first stop plate through the second aperture part.

16. A device fabricating method comprising the steps of:

10 exposing an object using an exposure apparatus; and

performing a predetermined process for the object that has been exposed,

wherein the exposure apparatus includes:

15 an illumination optical system for illuminating a mask using light from a light source; and

20 a projection optical system for projecting light from said illumination optical system onto an object to be exposed,

wherein said illumination optical system includes a shape varying mechanism for continuously making a shape of an effective light source variable,

25 wherein said shape varying mechanism includes:

a first stop plate that has a first aperture part for allowing the light to pass through the first aperture part; and

a second stop plate that has second aperture part for allowing the light that has passed through the first stop plate through the second aperture part.

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